SECTION IV.—RIVERS AND FLOODS.

RIVERS AND FLOODS, APRIL, 1915.

By ALFRED J. HENRY, Professor in charge of River and Flood Division.

[Dated: Washington, D. C., May 27, 1915.]

The only floods of consequence during the month were in the rivers of the Southwest, viz, those of Texas, including the Pecos and Rio Grande, the Red, and the Arkansas. All the floods were due to general rains over the respective watersheds.

There were two high water periods in the Red River, the first continuing from the 15th to the 18th, but the second and greatest from the 27th to the end of the month. The river passed above flood stage along the stretch from Arthur City, Tex., to Fulton, Ark. Elsewhere only freshet stages were recorded, although both the Sulphur and the Cypress, tributaries of the Red, were at and above flood stages during the closing days of the month. The Little River of Arkansas was also at flood stage on the 29th and 30th.

Texas rivers.—Trinity: A flood occurred in the upper reaches of this stream beginning about the 24th. At the close of the month this flood had not yet reached the Gulf.

Brazos, Colorado, and Guadalupe: Similarly, a flood in these rivers was in progress in the lower reaches at the close of the month.

During the week beginning April 18, 1915, west central Texas, particularly the counties of Travis, Williamson, Milam, and Bell were visited by a series of extraordinarily heavy local downpours of rain, attended by thunder and lightning. As a consequence the smaller creeks and streams overflowed their banks and wrecked a large number of dwellings, and thus caused a considerable loss of life. On May 3 it was estimated that 40 persons had lost their lives as a result of the floods. Twenty-one bodies were recovered at Austin, Tex., where the rainfall was 10 inches in 24 hours. The Colorado River at Austin, however, lacked half a foot of reaching the flood stage. The large loss of life in most cases occurred along the smaller streams. For additional information about floods in Texas see the article by B. Bunnemeyer below.

Rio Grande: Frequent rains in New Mexico and southwest Texas, particularly in the watershed of the Pecos River, from the 14th to the 18th, caused a moderate flood in that stream, which crested in a stage of 19.5 feet at Pecos, Tex., on the 21st. Relatively high stages were also recorded in the Rio Grande and in general the streams of eastern New Mexico, including the Canadian, were at freshet stages during the latter part of the month.

Heavy rains also affected the Arkansas in its course through Kansas, Oklahoma, and Arkansas, but the floods were not destructive in any case.

Damages.—In the vicinity of Carlsbad, N. Mex., the damage to canal headwork on the Carlsbad project, was approximately $5,000 and miscellaneous losses about $1,000. In the extreme southern part of the valley, in the vicinity of Barstow and Pecos, Tex., the damage to canals and the irrigation flume across the river is estimated at $4,000, and to alfalfa in fields $3,000. The prospective losses in alfalfa, cotton, and feed from water shortage due to damage to canals and flume, will probably amount to $25,000 or $30,000. In this vicinity property valued at $9,000 was saved by the warnings sent from the Denver office of the Bureau.

Hydrographs for typical points on several principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.

FLOODS IN TEXAS DURING APRIL AND MAY, 1915.

By B. BUNNEMEYER, Section Director.

[Dated Weather Bureau, Houston, Tex., May 30, 1915.]

The floods that occurred in Texas during the last decade of April, 1915, and extended well into May, while far from approaching the severity of the record-breaking floods of December, 1913, are memorable from the fact that they caused a loss of 40 lives and an indeterminable but immense damage to crops, which had to be replanted not only in the flooded area but also in sections where the soil had been washed by heavy rains. Incomplete returns give an estimated damage of $2,354,125, exclusive of losses sustained by railroad, telegraph and telephone companies, classified as follows:

TABLE 1.—*Losses by the Texas floods of April–May, 1915.*

Losses in—	Watersheds.				
	Colorado.	Brazos.	Trinity.	Guadalupe.	Total.
County bridges, roads, buildings, etc.	$650,750	$159,900	$15,400	$500	$826,550
Crops	5,250	1,324,000	6,000	6,500	1,341,750
Live stock	.....	68,825	.....	.....	68,825
Suspension of business	.....	102,500	10,000	4,500	117,000
Total	656,000	1,655,225	31,400	11,500	2,354,125

The total damage, and especially the damage to crops, is much greater than the estimate here given on account of the small number of returns received and of the fact that in many instances no monetary value was affixed to the losses sustained.

Nearly all the deaths occurred in the creeks that were rapidly converted into raging torrents by the heavy rains and caught the people unawares. Of the 40 deaths perhaps 8 could have been prevented by the exercise of a little caution.

Considerably over one-half of the total damage reported was due to loss of crops in the field; over one-third consisted of damage to buildings, bridges, and roads, mostly in the city of Austin: and the remainder, less than one-twelfth, represents losses by suspension of business and drowning of live stock. Railroads suffered considerably from washouts and interruption to traffic.

From April 14 to 20, 1915, a series of local showers occurred over the Guadalupe, Colorado, Brazos, and Trinity watersheds, which became sufficiently cumulative to justify the issuance of advisory warnings on April 20

for the Guadalupe and lower Colorado. Most of this rainfall soaked into the ground and no dangerous rises occurred. On April 21 the precipitation was too light to affect the streams; but on the 22d unusually heavy showers set in, which were reported on the morning of April 23 and resulted in an immediate issuance of flood warnings for the Guadalupe, middle and lower Colorado, middle and lower Brazos, and upper Trinity. These warnings were followed up from time to time by advices and reports of the progress of the floods.

Colorado River.—The Colorado flood began during the night of April 22–23. A heavy rain set in at Austin about 7:45 p. m., April 22, and by midnight as much as 8 inches of water had fallen. The rain converted Waller and Shoal Creeks into raging torrents, and the flood damage and loss of life at Austin are almost entirely due to the overflows of these creeks. Shoal Creek empties into the Colorado below the dam and about one-half mile above Congress Avenue wagon bridge, on which the river gage is located, and Waller Creek about one-half mile below that bridge. The river gage therefore showed only the flood waters coming in from Shoal Creek. The channels of these creeks are naturally narrow, and on Waller Creek houses had been built to the edge of the banks. The width of either stream at the time of the crest did not exceed one-fourth of a mile, and possibly as much as 6 square miles of territory were submerged. The depth of the water in the middle of the channels was probably as much as 30 or 40 feet. The damage occurred between 11 p. m., April 22, and 1 a. m., April 23, and by sunrise the creeks had practically run down.

The daily rainfalls and river stages resulting are presented in Tables 2 and 3.

TABLE 2.—*Rainfalls over the Colorado watershed, April 14–26, 1915.*

Stations.	Total, Apr. 14–20.	Daily rainfalls, Apr. 21–26, 1915.						
		21	22	23	24	25	26	Total.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Lamesa	1.56	0.24	.....	0.90	2.30	.....	.....	3.44
Midland	1.71	.....	0.82	.....	.....	1.03	.....	1.85
Garden City	1.11	.....	1.05	.....	0.09	0.66	.....	1.80
Snyder	3.07	.....	0.12	0.69	.....	2.00	.....	2.81
Big Spring	1.61	0.15	0.75	.....	0.16	1.29	.....	2.35
Colorado	1.66	.....	.....	1.01	.....	.....	.....	1.01
San Angelo	1.25	.....	2.63	1.12	.....	0.80	.....	4.55
Knickerbocker	1.15	.....	2.73	T.	T.	0.80	.....	3.53
Ballinger	1.20	.....	1.10	1.20	T.	1.09	.....	3.30
Coleman	0.68	0.85	1.88	.....	T.	1.50	.....	4.23
Brownwood	0.12	.....	0.40	1.20	.....	0.50	0.25	2.35
San Saba	1.63	.....	1.61	0.64	.....	1.28	.....	3.53
Junction	0.95	.....	1.38	.....	.....	1.10	.....	2.48
Llano	1.80	0.80	0.03	0.70	.....	0.78	0.33	2.64
Marble Falls	2.07	T.	T.	1.60	.....	1.00	1.60	4.20
Fredericksburg	2.01	.....	0.61	.....	T.	1.78	.....	2.39
Duval	2.03	.....	0.52	6.58	0.20	5.89	.....	13.19
Austin	2.78	.....	.....	10.00	0.29	3.05	3.00	16.34
La Grange	3.35	.....	0.02	3.09	0.04	1.53	0.30	4.98
Columbus	1.80	.....	.....	1.78	2.10	0.32	0.20	4.40
Bay City	0.00	.....	.....	.....	3.76	0.70	T.	4.46
Pierce	0.36	.....	.....	2.53	1.76	2.02	0.03	6.34
Total	33.99	2.04	15.65	33.04	10.70	29.03	5.71	96.17
General means	1.54	0.09	0.71	1.50	0.49	1.32	0.26	4.37

T=Trace of precipitation, i. e., less than 0.01 inch.

The destruction of buildings, bridges, culverts, and damage accomplished to streets by the flood waters is estimated at about $650,000, and 32 persons are known to have drowned. One of the persons drowned lost his life on Bee Creek, which empties into the Colorado just above the dam. A second flood occurred at Austin in the afternoon of April 25, with gage readings 17.5 feet at 3 p. m. and 17.8 feet at 7 a. m. next morning. These two floods had a fall of 8 feet between their crests at Lagrange, but at Columbus the fall was not pronounced. At this last-named station the crest passed at 4 p. m. April 28, with gage reading 36.3 feet. This is 7.8 feet lower than recorded during the flood of December, 1913. The width of the flooded area below Columbus was from one-half to two miles.

TABLE 3.—*River stages of the Colorado River during flood, April 15–May 10, 1915.*

[8 a. m., 75th meridian time or 6 a. m., 105th meridian time.]

	Ballinger.	Marble Falls.	Austin.	Columbus.
Flood stage	21 feet.	38 feet.	18 feet.	24 feet.
	Feet.	*Feet.*	*Feet.*	*Feet.*
Apr. 15	1.0	2.7	1.0	8.5
16	1.0	2.6	1.3	8.5
17	1.0	2.6	2.7	7.9
18	1.0	3.0	4.1	7.8
19	1.0	3.2	3.9	7.5
20	4.0	3.6	3.9	18.1
21	2.0	5.4	3.8	19.2
22	4.0	4.9	1.9	14.8
23	7.0	6.2	6.8	16.9
24	2.0	10.2	5.0	**33.8**
25	7.6	10.8	10.5	**35.0**
26, 8 a. m.	4.0	13.4	17.8	**34.8**
26, 5 p. m.	16.0	.....	.....	.....
27	11.0	10.0	12.0	**35.8**
28, 8 a. m.	12.0	12.9	11.0	**36.2**
28, 4 p. m.	.....	.....	.....	**36.3**
29	3.0	12.0	12.0	**35.4**
30	4.0	9.0	10.5	**32.9**
May 1	2.0	8.0	8.4	**30.7**
2	2.0	5.6	6.5	**26.0**
3	2.0	5.0	5.4	22.2
4	2.0	5.2	6.0	19.4
5	4.0	5.6	5.0	18.2
6	3.0	5.4	4.8	18.0
7	3.0	5.2	4.8	16.5
8	3.0	5.0	4.5	16.2
9	2.0	4.6	4.2	15.5
10	2.0	4.5	4.0	15.0

Stages at or above flood stage are in black-face type.

Brazos River.—The flood in the Brazos was much severer than that in the Colorado so far as monetary value of the damage sustained is concerned; but there were only five deaths by drowning and these appear to have been accidental or the result of foolhardiness. In the upper portion of the stream from Brazos in Palo Pinto County to near Valley Junction in Robertson County there were two distinct but mild floods, which resulted in a comparatively slight loss of crops only. At Valley Junction, however, the flood was severe, due to an immense volume of water coming in from the Little River. On the morning of April 23 unusually heavy rains were reported from the Little River watershed, with 8.29 inches at Taylor and 7.30 inches at Cameron. The river observer at Valley Junction reported a stage of 26 feet at 7 a. m. of the 23d, and on the following morning he reported the gage under water and inaccessible. Later he found that the height of the water on April 24 corresponded to a gage reading of 50 feet. This is the highest observed at Valley Junction and is 5 feet less than the crest of the record flood of December, 1913. The crest of the flood was at Washington 7 p. m. April 27, with a stage of 52.9 feet. The stream remained stationary for 12 hours and then began to fall slowly. It reached Hempstead on April 29, with a stage of 46.5 feet; and Rosenberg at 11 p. m. May 1, with a stage of 46.4 feet. No records were obtained from either Washington or Rosenberg in December, 1913, but at Hempstead the stream was 6.3 feet higher in December, 1913, than in the present flood. The width of the stream ranged from about 1½ to 5 miles at and below Valley Junction, and a few of the smaller towns were partly under water. (See Tables 4 and 5.)

TABLE 4.—*Rainfalls over the Brazos watershed, Texas, April 14–26, 1915.*

Stations.	Total, Apr. 14–20.	Rainfall Apr. 21–26, 1915.						
		21	22	23	24	25	26	Total.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Plainview	2.76	0.16	.....	.....	0.18	2.10	.....	2.44
Mount Blanco	1.15	.....	.....	.....	T.	2.00	.....	2.00
Lubbock	2.51	0.60	T.	.....	0.31	1.51	.....	2.42
Tahoka	1.32	T.	.....	.....	1.79	2.98	.....	4.77
Post	1.94	.....	.....	.....	0.42	2.03	.....	2.45
Spur	2.22	.....	.....	0.08	.....	2.00	.....	2.08
Aspermont	2.64	.....	0.48	.....	1.94	.....	.....	2.42
Haskell	1.87	.....	1.18	0.40	.....	1.31	.....	2.89
Goree	1.01	0.78	0.21	.....	1.61	.....	.....	2.60
Seymour	0.94	.....	1.78	0.16	1.00	1.01	.....	3.95
Claytonville	1.12	.....	1.38	T.	0.04	1.10	.....	2.42
Abilene	2.90	0.64	1.33	.....	0.06	1.49	.....	3.52
Hamlin	2.23	.....	.....	0.50	.....	1.30	.....	1.80
Stamford	1.71	T.	2.10	.....	.....	1.20	.....	3.30
Albany	1.25	.....	1.90	.....	.....	1.10	.....	3.00
Graham	2.04	0.57	1.20	.....	2.36	0.92	.....	5.05
Putnam	0.20	.....	2.45	.....	1.80	.....	.....	4.25
Brazos	1.03	.....	0.38	3.64	.....	0.21	1.74	5.97
Eastland	0.66	.....	0.02	1.03	T.	2.04	0.04	3.73
Panter	1.38	T.	1.04	.....	0.46	.....	2.45	3.95
Dublin	1.39	.....	0.30	1.29	.....	0.40	0.85	2.84
Cleburne	0.83	.....	1.43	0.81	.....	0.81	0.27	3.32
Hico	1.17	.....	1.56	.....	0.14	1.43	.....	3.13
Kopperl	1.10	.....	0.70	2.80	.....	0.44	0.60	4.54
Clifton	1.00	T.	2.01	1.20	0.16	0.54	0.01	3.92
Hillsboro	0.92	.....	0.15	2.45	0.28	0.80	0.76	4.44
Lampasas	1.89	.....	0.06	2.51	.....	0.31	1.00	3.88
Gatesville	0.80	.....	1.30	1.70	0.10	0.35	.....	3.45
McGregor	1.80	.....	3.20	.....	0.25	0.75	.....	4.20
Waco	1.17	T.	T.	2.00	0.12	0.83	0.94	3.89
Hewitt	2.04	0.06	1.48	1.06	0.05	0.64	0.63	3.92
Gorham	2.19	0.34	T.	2.60	0.14	0.50	0.56	4.14
Mexia	0.65	0.06	.....	5.20	0.88	2.03	0.60	8.77
Salado	2.71	.....	1.97	1.32	.....	1.48	1.08	5.85
Temple	1.91	.....	.....	3.30	0.20	0.59	2.53	6.62
Taylor	1.70	.....	8.29	1.50	2.01	1.95	.....	13.75
Georgetown	1.99	.....	0.02	3.05	0.20	0.86	2.74	6.87
Cameron	1.89	.....	7.30	0.22	3.51	1.27	.....	12.30
Valley Junction	1.50	0.50	.....	2.50	1.00	2.00	.....	6.00
College Station	2.75	.....	T.	2.97	0.98	0.42	0.13	4.50
Somerville	1.60	.....	T.	3.00	.....	0.30	T.	3.30
Navasota	1.73	.....	.....	1.20	2.45	1.10	0.14	4.89
Brenham	1.33	.....	.....	1.03	1.70	0.70	0.30	3.73
Hempstead	1.30	0.45	.....	1.05	2.15	0.45	0.10	4.20
Sealy	0.83	.....	0.06	2.27	0.39	0.04	0.02	2.78
Sugarland	1.14	.....	.....	.....	1.62	0.35	.....	1.97
Rosenberg	1.41	T.	.....	0.17	4.35	1.01	0.01	5.54
Brazoria	0.16	.....	0.06	3.48	0.35	.....	0.09	3.98
Total	73.78	4.16	45.24	57.09	35.00	46.65	17.59	205.73
General means	1.54	0.09	0.94	1.19	0.73	0.97	0.37	4.29

T.= Trace of precipitation, less than 0.01 inch.

TABLE 5.—*River stages of the Brazos River during flood, April 15–May 10, 1915.*

[8 a. m., seventy-fifth meridian time, or 6 a. m., one hundred and fifth meridian time.]

Flood stage	Brazos. 12 feet.	Kopperl. 21 feet.	Waco. 22 feet.	Valley Junction. 40 feet.	Washington. 45 feet.	Hemp. 40 feet.	Rosenberg. 39 feet.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Apr. 15	1.7	0.9	5.8	4.3	11.2	4.2	2.8
16	2.2	0.8	6.1	4.2	11.0	3.1	2.6
17	2.2	0.8	6.0	4.0	9.4	2.0	2.3
18	2.1	0.8	5.9	3.8	9.2	2.8	2.0
19	2.1	1.0	5.8	3.8	9.1	2.9	2.0
20	2.0	1.4	7.5	5.0	11.4	2.4	2.1
21	2.0	2.6	8.5	9.5	20.6	6.6	3.8
22	5.0	2.8	7.5	12.4	22.0	12.9	8.3
23	10.0	13.0	20.0	26.0	23.1	13.8	10.1
23	.....	.....	**25.3**	.....	.....	.....	.....
24	7.5	13.6	21.2	**50.0**	**44.0**	32.4	16.5
25	7.5	9.5	18.5	**46.0**	**47.1**	36.0	28.7
26	**16.0**	19.0	**21.6**	**44.0**	**50.5**	36.8	31.0
26	**16.4**	.....	**28.0**	.....	.....	.....	.....
27	**13.0**	20.0	**24.8**	**42.0**	**52.4**	**43.4**	31.5
27, 7 p. m.	.....	.....	.....	.....	**52.9**	.....	.....
28	**13.6**	18.6	**23.7**	**41.0**	**52.9**	**46.2**	33.3
29	7.8	16.8	**23.3**	36.0	**52.7**	**46.5**	35.0
30	7.0	8.2	16.2	32.6	**51.9**	**45.6**	**39.5**
May 1	.....	7.0	14.0	26.5	**51.0**	**44.5**	**45.2**
1, 11 p. m.	.....	.....	.....	.....	.....	.....	**46.4**
2	.....	5.8	12.8	18.0	**49.7**	**43.0**	**46.3**
3	.....	6.4	11.5	16.5	**48.3**	**42.2**	**45.8**
4	.....	5.0	10.9	15.0	**46.3**	**40.6**	**44.9**
5	.....	6.2	12.9	13.5	**43.3**	**38.8**	**43.8**
6	.....	6.0	12.0	12.0	40.4	36.0	**42.2**
7	.....	5.6	11.3	12.0	36.3	32.4	**39.8**
8	.....	5.4	10.5	12.9	33.1	29.2	36.9
9	.....	5.4	9.7	9.5	29.9	28.4	32.0
10	.....	6.0	13.2	8.0	27.1	24.6	23.5

Stages at or above flood stage are in black-faced type.

Lowlands were deserted before the water came and stock and property moved out as far as possible. All crops submerged proved a total loss and some farms were completely ruined. In some places sand banks 3 to 5 feet high washed up, and in other places big holes and gullies were left. The crest of the flood reached the Gulf on May 6.

TABLE 6.—*Rainfalls over the Trinity watershed, Texas, April 14–26, 1915.*

Stations.	Total Apr. 14–20.	Rainfall, Apr. 21–26, 1915.						
		21	22	23	24	25	26	Total.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Bowie	1.17	.....	1.17	2.89	.....	3.54	.....	7.60
Antelope	1.13	.....	0.63	.....	0.12	1.70	0.09	2.54
Gainesville	1.22	0.55	1.50	0.49	.....	0.31	0.73	3.58
Bridgeport	0.63	T.	0.32	2.10	T.	0.97	2.00	5.39
Weatherford	0.77	.....	0.28	1.02	.....	0.90	1.55	3.75
Grapevine	0.73	.....	2.24	0.20	0.20	.....	1.52	4.16
Fort Worth	0.55	.....	1.32	1.26	0.30	0.94	.....	3.82
Denton	0.41	0.12	1.32	0.77	T.	0.24	1.28	3.73
McKinney	0.16	0.24	2.14	1.95	0.40	0.10	1.67	6.50
Dallas	0.15	T.	1.87	1.13	T.	0.36	.....	3.36
Kaufman	0.26	T.	0.93	2.60	0.70	0.26	0.88	5.37
Waxahachie	0.69	.....	.....	3.60	0.54	0.28	0.72	5.14
Trinidad	0.23	.....	.....	3.84	1.69	0.75	1.46	7.74
Corsicana	0.18	.....	.....	3.15	0.60	0.92	2.20	6.87
Palestine	0.58	T.	0.10	2.79	1.75	0.53	1.26	6.43
Long Lake	0.80	.....	.....	0.90	1.96	1.88	0.60	5.34
Jewett	3.25	.....	1.05	.....	1.10	3.00	0.35	5.50
Crockett	1.64	.....	0.10	1.44	2.70	0.29	0.25	4.75
Riverside	2.00	0.18	.....	0.25	0.97	0.37	T.	1.77
Huntsville	2.92	0.20	.....	0.40	0.79	0.16	0.09	1.64
Liberty	2.25	T.	.....	0.07	0.60	T.	0.7	0.74
Total	21.72	1.29	14.97	30.85	14.42	17.47	16.72	95.72
General means	1.03	0.06	0.71	1.47	0.69	0.83	0.80	4.56

T.= Trace of precipitation; less than 0.01 inch.

TABLE 7.—*River stages of the Trinity River during flood of April 15–May 20, 1915.*

[8 a. m., 75th meridian time; 6 a. m., 105th meridian time.]

Flood stage	Bridgeport, 20 feet.	Fort Worth, 20 feet.	Dallas, 25 feet.	Longlake, 40 feet.	Riverside, 40 feet.	Liberty. 25 feet.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Apr. 15	1.5	5.0	9.3	20.5	6.8	11.3
16	1.5	4.6	8.5	20.9	7.4	10.0
17	1.4	4.2	7.9	18.5	9.8	9.0
18	1.4	4.0	7.5	16.5	10.5	10.5
19	3.9	4.0	7.3	14.0	10.2	12.0
20	5.8	4.4	7.3	12.8	16.0	13.0
21	4.2	4.5	8.3	11.5	16.5	13.5
22	1.8	5.7	10.1	9.4	14.3	18.2
23	**25.0**	14.0	21.8	10.5	12.4	20.9
24	**20.6**	6.4	**29.9**	29.7	16.3	21.3
25	16.8	8.1	**32.4**	36.0	22.0	21.0
26	**25.3**	**29.4**	33.3	39.0	29.8	21.9
26, 6 p. m.	.....	**32.4**	.....	.....	.....	.....
27	**22.7**	**26.1**	**35.5**	**42.0**	32.4	23.0
28	**22.5**	**29.8**	**35.7**	**44.8**	32.0	24.0
29	18.9	**29.4**	**36.2**	**46.4**	31.0	24.5
29, 7.30 p. m.	.....	.....	**36.7**	.....	.....	.....
30	9.5	**22.0**	**36.5**	**46.1**	30.4	**25.0**
May 1	5.5	**22.6**	**35.5**	**45.5**	28.3	**25.4**
2	4.6	**20.8**	**33.3**	**44.8**	28.3	**25.7**
3	3.9	15.0	**32.0**	**43.9**	29.0	**26.0**
4	3.0	12.4	**31.1**	**43.5**	31.6	**26.2**
5	2.8	7.8	**29.4**	**43.0**	34.0	**26.3**
6	2.8	6.4	22.0	**43.0**	36.1	**26.4**
7	5.2	7.3	16.8	**43.3**	37.8	**26.4**
8	4.5	5.9	23.0	**43.0**	38.7	**26.4**
9	4.0	5.4	24.9	**43.2**	39.1	**26.5**
10	7.7	7.9	19.7	**43.0**	38.9	**26.6**
11	6.4	6.6	15.4	**42.8**	38.1	**26.7**
12	3.5	6.1	16.1	**42.4**	37.5	**26.8**
13	3.2	5.8	16.0	**42.0**	37.1	**26.9**
14	3.0	6.4	15.4	**41.6**	36.7	**27.0**
15	3.0	6.0	14.6	**41.1**	36.2	**27.1**
16	2.8	5.6	12.5	**40.5**	36.0	**27.2**
17	2.5	5.0	10.9	**40.0**	35.7	**27.3**
18	2.5	4.8	9.9	38.8	35.3	**27.3**
19	2.2	4.6	12.7	36.5	34.5	**27.3**
20	2.0	9.8	11.3	30.5	33.2	**27.3**

Stages at or above flood stage are in black-face type.

Trinity River.—The Trinity River flood was comparatively mild, and the resulting losses small when compared with those sustained in the Brazos and Colorado overflows. The rainfall is presented in detail by Table 6, below. The stream was strongly fluctuating above Dallas from April 22 to 27, but at Dallas there was a continuous rise after the flood stage was reached on the 23d. The crest occurred at 7.30 p. m. April 29, with stage 36.7 feet, and the water continued out of banks until the night of May 5–6. At Long Lake, which is near Palestine and 109 miles below Dallas, the crest occurred also on April 29, due to flood waters coming in from Cedar and Pecan Creeks, which drain a considerable territory above Long Lake. The subsidence of the flood at Long Lake was slow and the water did not get within banks again until May 17. At Liberty, the lowest river station on the Trinity, flood stage was reached on April 30.

The stream rose extremely slowly until May 17, as shown by Table 7, when it attained a stage of 27.3 feet, remained stationary during the next five days, and then began to recede as slowly as it had risen. At Dallas one person accidentally fell into the stream and was drowned. The stream flows through much woodland after leaving Dallas and comparatively little territory is under cultivation, so that the crop damage could not have been excessive. No animals were reported lost, although stock, and especially hogs, are permitted to run at large in the woods.

Guadalupe River.—On the Guadalupe River the flood was of comparatively short duration at Gonzales. On April 21 the river got bank full at that place and then fell rapidly, but, as shown by Table 9, it soon rose again on the 24th, and by 5.30 a. m., April 25, attained a stage of 30 feet, its highest reported stage. The rainfall is shown in Table 8. At Victoria, which is below Gonzales, the stream rose steadily from April 21 to April 28, when the crest passed with a stage of 24.5 feet. The flood subsided by May 5. The flats at the edge of Victoria were under several feet of water at the height of the flood.

TABLE 8.—*Rainfall on the Guadalupe watershed April 14–26, 1915.*

Stations.	Total Apr. 14–20.	Rainfall Apr. 21–26, 1915.						
		21	22	23	24	25	26	Total.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
Kerrville	1.66	.....	0.08	0.74	0.00	0.75	1.03	2.60
New Braunfels	5.41	.....	.....	2.30	0.52	0.57	0.22	3.61
Luling	3.93	.....	.....	1.58	0.65	0.76	0.10	3.09
Blanco	1.68	.....	.....	1.90	0.47	0.26	1.33	3.96
San Marcos	1.00	.....	.....	1.50	0.49	0.71	0.61	3.31
Flatonia	2.44	.....	0.10	2.64	3.95	0.20	0.20	7.09
Gonzales	2.67	.....	.....	2.07	0.41	0.47	0.08	3.03
Cuero	1.27	.....	.....	2.98	0.57	0.44	0.15	4.14
Victoria	0.05	.....	.....	1.96	1.20	.....	.....	3.25
Austwell	0.00	.....	.....	0.87	1.43	.....	.....	2.30
Total	20.11	0.00	0.18	18.54	9.78	4.16	3.72	36.58
General means	2.01	0.00	0.02	1.85	0.98	0.42	0.37	3.64

TABLE 9. *Stages of the Guadalupe River, April 15 to May 10, 1915.*

[8 a. m., 75th meridian time; 6 a. m., 105th meridian time.]

Flood stage	Gonzales. 22 feet.	Victoria. 16 feet.	Flood stage	Gonzales. 22 feet.	Victoria. 16 feet.
	Feet.	*Feet.*		*Feet.*	*Feet.*
Apr. 15	2.5	3.9	Apr. 28	**27.0**	**24.5**
16	2.5	2.8	29	**24.3**	**24.3**
17	2.3	2.8	30	**19.0**	**24.0**
18	2.3	2.9	May 1	**11.5**	**23.8**
19	8.3	2.9	2	**9.9**	**22.9**
20	20.8	3.3	3	**9.0**	**22.4**
21	**22.0**	14.4	4	**8.2**	**16.8**
22	17.5	**19.2**	5	**7.7**	15.4
23	9.6	**21.4**	6	**10.0**	14.4
24	21.8	**22.6**	7	**10.7**	13.9
25	**29.9**	**23.0**	8	**9.0**	13.3
25 5.30 a. m.	**30.0**	.....	9	**7.3**	12.6
26	**29.0**	**23.0**	10	**6.7**	10.3
27	**28.2**	**23.9**			

Stages at or above flood stage are in black face type.

It is regretted that the returns received were too meager to give an adequate idea of the losses sustained. Replanting of crops was begun immediately upon the subsidence of the floods and, with favorable weather conditions, the outlook is not discouraging.

MEAN LAKE LEVELS DURING APRIL, 1915.

By UNITED STATES LAKE SURVEY.

[Dated: Detroit, Mich., May 6, 1915.]

The following data are reported in the "Notice to Mariners" of the above date:

Data.	Lakes.			
	Superior.	Michigan and Huron.	Erie.	Ontario.
Mean level during April, 1915:	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Above mean sea level at New York	601.34	579.48	571.45	245.04
Above or below—				
Mean stage of March, 1915	−0.16	−0.09	+0.08	−0.23
Mean stage of April, 1914	−0.50	−0.60	−0.73	−1.71
Average stage for April, last 10 years	−0.30	−0.91	−0.97	−1.44
Highest recorded April stage	−1.35	−3.75	−2.73	−3.39
Lowest recorded April stage	+0.80	+0.26	+0.19	+0.20
Probable change during May, 1915	+0.3	+0.3	+0.4	+0.4